

## **Supplementary information**

### **Title:**

The *EGFR* mutation status affects the relative biological effectiveness of carbon-ion beams in non-small cell lung carcinoma cells

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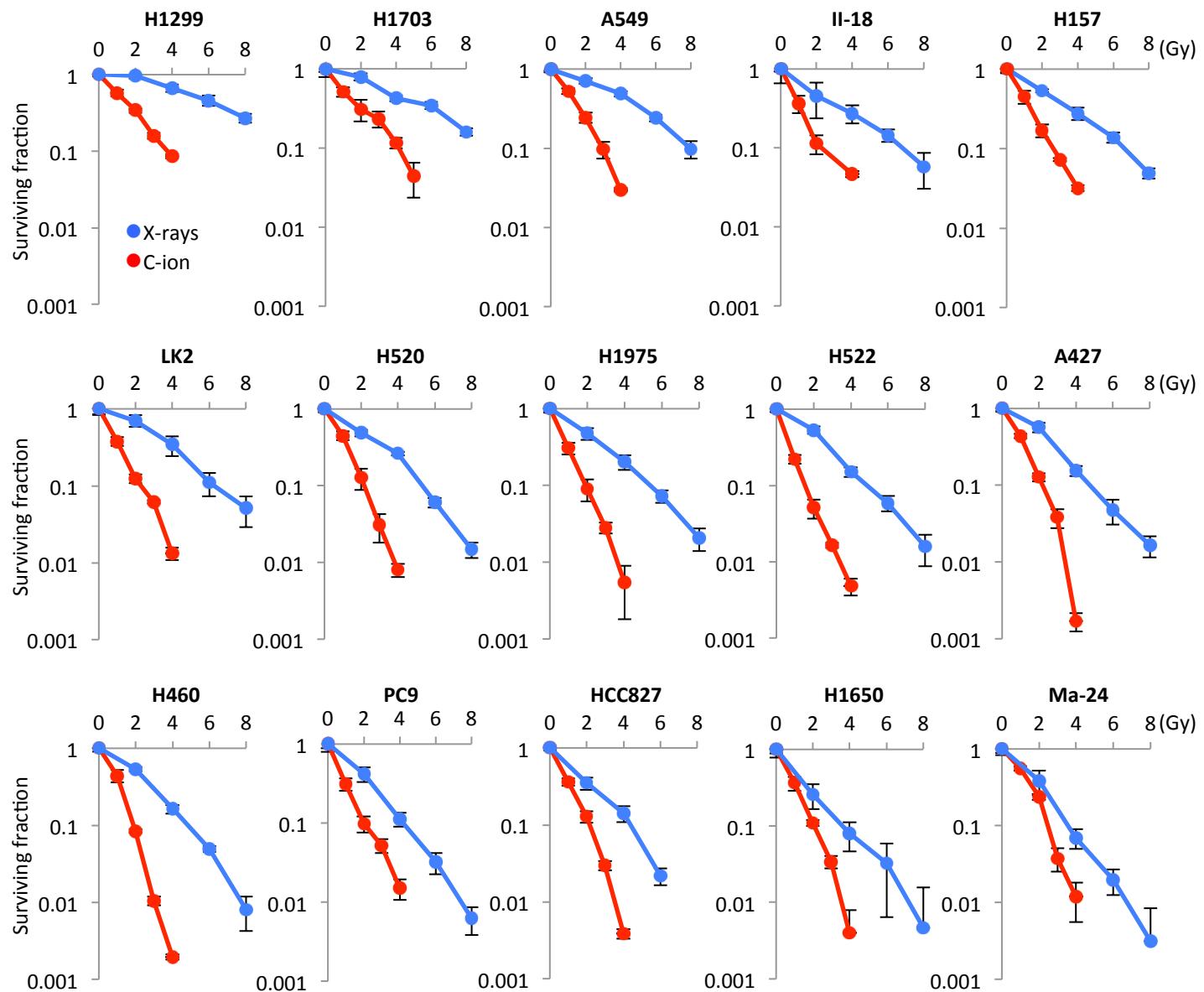
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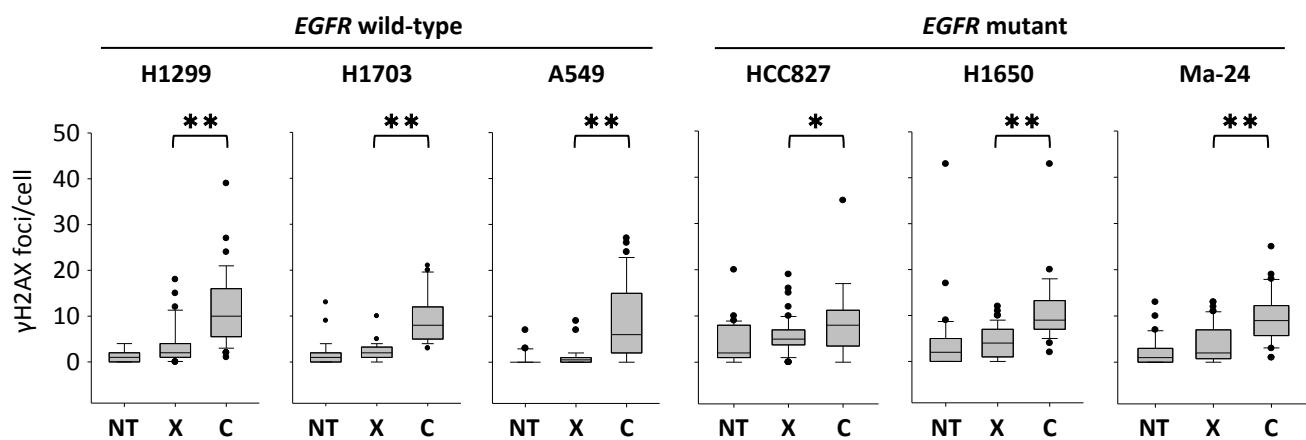
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# Supplementary Figure 1



## Supplementary Figure 2



**Supplementary Figure 2.** Repair of X-ray- or carbon-ion beam-induced DSBs in *EGFR*-mutant or wild-type NSCLC lines assessed by immunofluorescence staining of γH2AX. Cells were exposed to X-rays (2 Gy) or carbon-ion beams (2 Gy) and stained with an antibody to γH2AX 24 h post-irradiation. The number of γH2AX foci per nucleus was scored in 30–50 cells for each experimental condition using a fluorescence microscope at  $\times 100$  magnification. The results of a representative experiment are shown as box plots. Note that the data of non-treated controls and those of carbon-ion beams are the same as in Figure 3 but now in the different context. \*,  $P < 0.05$ ; \*\*,  $P < 0.001$ . NT, non-treated controls; X, X-rays; C, carbon-ion beams.

# Supplementary Table 1

**Supplementary Table 1. Mutation status in *EGFR* and *KRAS* in NSCLC lines**

Cell line	Histopathology	<i>EGFR</i>	<i>KRAS</i>	Reference
Ma-24	Adenocarcinoma	L858R, E709G	Wild-type	15, 16
PC9	Adenocarcinoma	ΔE746_A750	Wild-type	15, 17
II-18	Adenocarcinoma	L858R	Wild-type	15, 17, 18
H1650	Adenocarcinoma	ΔE746_A750	Wild-type	15, 19
H1975	Adenocarcinoma	L858R, T790M	Wild-type	17, 19, 20
HCC827	Adenocarcinoma	ΔE746_A750	Wild-type	19, 20
A427	Adenocarcinoma	Wild-type	G12D	15, 18
A549	Adenocarcinoma	Wild-type	G12S	15, 18-20
H157	Squamous cell carcinoma	Wild-type	G12R	15, 18, 19
H460	Large cell carcinoma	Wild-type	Q61H	15, 18-20
H522	Adenocarcinoma	Wild-type	Wild-type	15
H1703	Adenocarcinoma	Wild-type	Wild-type	15, 19
H520	Squamous cell carcinoma	Wild-type	Wild-type	15, 19, 20
LK2	Squamous cell carcinoma	Wild-type	Wild-type	15, 17
H1299	Large cell carcinoma	Wild-type	Wild-type	15

## Supplementary Table 2

**Supplementary Table 2. D<sub>10</sub> for X-rays and carbon-ion beams, and RBE in A549-WT, -ΔE746-A750 and -L858R cells**

	D <sub>10</sub> (X-rays)	D <sub>10</sub> (C-ion)	RBE
A549-WT	7.0	3.7	1.9
A549-ΔE746-A750	5.6	3.6	1.5
A549-L858R	4.7	3.6	1.3

C-ion, Carbon-ion.

# Supplementary Table 3

Supplementary Table 3. P values on the significant differences in the number of γH2AX foci

	X-ray alone						X-ray + NU7441						Carbon-ion beams alone						Carbon-ion beams + NU7441						
	H1299	H1703	A549	HCC827	H1650	Ma-24	H1299	H1703	A549	HCC827	H1650	Ma-24	H1299	H1703	A549	HCC827	H1650	Ma-24	H1299	H1703	A549	HCC827	H1650	Ma-24	
H1299	-	0.68	0.0075	3.9E-07	1.4E-07	5.3E-07	-	0.38	0.41	0.53	0.76	0.06	-	0.88	0.73	0.46	0.38	0.99	-	0.38	0.41	0.53	0.76	0.056	
H1703	-	-	0.0046	9.6E-07	4.8E-07	1.6E-06	-	-	0.11	0.16	0.27	0.0083	-	-	0.82	0.51	0.29	0.88	-	-	0.76	0.16	0.93	0.76	
A549	-	-	-	8.4E-10	3.4E-10	2.8E-09	-	-	-	0.86	0.64	0.32	-	-	-	0.72	0.27	0.74	-	-	-	0.13	0.82	0.58	
HCC827	-	-	-	-	0.53	0.62	-	-	-	-	0.77	0.25	-	-	-	-	-	0.14	0.45	-	-	-	-	0.28	0.27
H1650	-	-	-	-	-	0.91	-	-	-	-	-	0.15	-	-	-	-	-	-	0.35	-	-	-	-	-	0.75